**In the Claims:**

1. (Previously Presented) A method of estimating characteristics of a plasma contained in a reaction chamber of a plasma reactor including a plurality of magnets that move with respect to the reaction chamber, the method comprising:

obtaining configuration and process condition data for the reaction chamber;

computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber from the configuration and process condition data; and

generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections.

2. (Original) A method according to Claim 1, wherein the plurality of moving magnets rotate about an axis of rotation, and wherein each of the plurality of cross-sections includes the axis of rotation.

3. (Original) A method according to Claim 1, wherein computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises performing the following actions for each of the cross-sections:

computing electron density and temperature for the cross-section using an iterative Monte Carlo computational procedure; and

computing ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation.

4. (Original) A method according to Claim 3, wherein computing the ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation comprises computing solutions to a continuity equation and Poisson's equation for the ion and neutral species.

5. (Original) A method according to Claim 3, further comprising determining a static magnetic field generated by the moving magnets, and wherein computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises

computing the plasma characteristics for each of the plurality of cross-sections from the determined static magnetic field, shape information for the reaction chamber, and plasma collision reaction data.

6. (Original) A method according to Claim 1, wherein generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises computing at least one of an electron density distribution, a temperature distribution, a distribution of ion species, a distribution of neutral species, and a flux incidence.

7. (Original) A method according to Claim 1, wherein generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises averaging the computed plasma characteristics for each of the plurality of cross-sections.

8. (Original) A method according to Claim 1, further comprising estimating an etching rate for a wafer positioned in the chamber from the generalized model of the plasma.

9. (Original) A method according to Claim 1, wherein the plasma reactor comprises a dipole ring magnet (DRM) plasma reactor.

10. (Previously Presented) An apparatus for estimating characteristics of a plasma contained in a reaction chamber of a plasma reactor including a plurality of magnets that move with respect to the reaction chamber, the apparatus comprising:

means for obtaining configuration and process condition data for the reaction chamber;

means for computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber from the configuration and process condition data; and

means for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections.

11. (Original) An apparatus according to Claim 10, wherein the plurality of moving magnets rotate about an axis of rotation, and wherein each of the plurality of cross-sections includes the axis of rotation.

12. (Original) An apparatus according to Claim 10, wherein the means for computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises:

means for computing electron density and temperature for a cross-section using an iterative Monte Carlo computational procedure; and

means for computing ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation.

13. (Original) An apparatus according to Claim 12, wherein the means for computing the ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation comprises means for computing solutions to a continuity equation and Poisson's equation for the ion and neutral species.

14. (Original) An apparatus according to Claim 12, further comprising means for determining a static magnetic field generated by the moving magnets, and wherein computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises computing the plasma characteristics for each of the plurality of cross-sections from the determined static magnetic field, shape information for the reaction chamber, and plasma collision reaction data.

15. (Original) An apparatus according to Claim 10, wherein the means for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises means for computing at least one of an electron density distribution, a temperature distribution, a distribution of ion species, a distribution of neutral species, and a flux incidence.

16. (Original) An apparatus according to Claim 10, wherein the means for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises means for averaging the computed plasma characteristics for each of the plurality of cross-sections.

17. (Original) An apparatus according to Claim 10, further comprising means for estimating an etching rate for a wafer positioned in the chamber from the generalized model of the plasma.

18. (Original) An apparatus according to Claim 10, wherein the plasma reactor comprises a dipole ring magnet (DRM) plasma reactor.

19. (Original) A computer program product for estimating characteristics of a plasma contained in a reaction chamber of a plasma reactor including a plurality of magnets that move with respect to the reaction chamber, the computer program product comprising program code embodied in a computer-readable storage medium, the program code comprising:

program code for computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber; and

program code for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections.

20. (Original) A computer program product according to Claim 19, wherein the plurality of moving magnets rotate about an axis of rotation, and wherein each of the plurality of cross-sections includes the axis of rotation.

21. (Original) A computer program product according to Claim 19, wherein the program code for computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises:

program code for computing electron density and temperature for a cross-section using an iterative Monte Carlo computational procedure; and

program code for computing ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation.

22. (Original) A computer program product according to Claim 21, wherein the program code for computing the ion and neutral species transmission phenomena for the cross-section from a plasma dynamics simulation comprises program code for computing solutions to a continuity equation and Poisson's equation for the ion and neutral species.

23. (Original) A computer program product according to Claim 21, further comprising program code for determining a static magnetic field generated by the moving magnets, and wherein the program code for computing plasma characteristics for each of a plurality of cross-sections of the reaction chamber comprises program code for computing the plasma characteristics for each of the plurality of cross-sections from the determined static magnetic field, shape information for the reaction chamber, and plasma collision reaction data.

24. (Original) A computer program product according to Claim 19, wherein the program code for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises program code for computing at least one of an electron density distribution, a temperature distribution, a distribution of ion species, a distribution of neutral species, and a flux incidence.

25. (Original) A computer program product according to Claim 19, wherein the program code for generating a generalized model of the plasma from the computed plasma characteristics for the plurality of cross-sections comprises program code for averaging the computed plasma characteristics for each of the plurality of cross-sections.

26. (Original) A computer program product according to Claim 19, further comprising program code for estimating an etching rate for a wafer positioned in the chamber from the generalized model of the plasma.

27. (Original) A computer program product according to Claim 19, wherein the plasma reactor comprises a dipole ring magnet (DRM) plasma reactor.

28. (Currently amended) A method of simulating plasma in a plasma apparatus having a plasma reactor and a plurality of permanent magnets which are asymmetrically arranged and rotate around the plasma reactor at predetermined speed, comprising the steps of:

(a) inputting a plasma reactor shape and process conditions and inputting plasma collision reaction data;

(b) 3-dimensionally computing static magnetic fields induced by the permanent magnets;

(c) computing electron density and temperature by a Monte Carlo method and interpreting the transmission phenomenon of ion and neutral species using the data of the steps (a) and (b) until they are converged; ~~and~~

(d) obtaining overall plasma characteristics using the converged values; and

wherein the step(c) comprises plasma simulation at 2-dimensional cross-sections for cross-sectional magnetic field distribution in a characteristic magnetic field direction.

29. (Canceled)

30. (Currently amended) The method of claim 2~~9~~8, wherein the 2-dimensional plasma simulation is performed for a plurality of 2-dimensional cross-sections including an axis, obtains convergence values for the respective cross-sections, and averages them to obtain plasma characteristics.

31. (Original) The method of claim 28, wherein the plasma apparatus is a DRM plasma apparatus.

32. (Currently amended) Computer readable recording media configured to support simulation of plasma in a plasma apparatus having a plasma reactor and a plurality of permanent magnets which are asymmetrically arranged and rotate around the plasma reactor at a predetermined speed, the computer readable recording medium configured to include a plurality of program modules comprising:

(a) a program module for inputting the plasma reactor shape and process conditions;

(b) a program module for inputting plasma collision reaction data;

(c) a program module for 3-dimensionally computing static magnetic fields induced by the permanent magnets;~~ and~~

(d) a program module for calculating electron density and temperature by a Monte Carlo method and interpreting the transmission phenomenon of ion and neutral species until they are converged; and

wherein the program module (d) is configured to perform plasma simulation for 2-dimensional cross-sections for cross-sectional magnetic field distribution in a characteristic magnetic field direction.

33. (Canceled)

34. (Currently amended) The computer readable recording media of claim 3~~3~~2, wherein the 2-dimensional plasma simulation is performed for a plurality of 2-dimensional cross-sections including an axis of rotation of the permanent magnets, obtains convergence values for the respective cross-sections, and averages them to obtain plasma characteristics.

35. (Original) The computer readable recording media of claim 32, wherein the plasma apparatus is a DRM plasma apparatus.